




LASER  
COMPONENTS®



THE RIGHT  
LASER MODULE  
FOR THE  
WOOD INDUSTRY

## ———— LASER TECHNOLOGY.

Laser modules solve many challenges in the wood industry: As positioning and marking aids, they ensure precise cuts and drillings. Additionally, in machine vision, they enhance the efficiency of sawmills and production lines.

To help you select the best laser for your specific positioning or image processing needs, this guide offers valuable tips and recommendations.







# POSITIONING LASERS

PRECISION IN A DEMANDING ENVIRONMENT

## / VISIBILITY

**Challenge:** To see where the saw, drill, or milling machine should be positioned, the position marker must be clearly visible. Of course, it is crucial to take the environmental conditions, such as the dust and the brightly illuminated workstations in the factory hall, into account.

**Solution:** Laser power and wavelength determine how well a laser line can be seen. The basic rule applies: the higher the laser power, the better the marking can be seen. However, there is also an upper limit because if a laser emits too much light, it can cause permanent damage to the operator's eyes. Therefore, it is important to comply with the mandatory eye-safe laser classes 1 or 2.

Laser modules are usually available in 520 nm (green) and 635 nm (red) wavelengths. At the same laser power, green light appears brighter to the human eye and is therefore easier to see. On the other hand, red lasers are less expensive.



## / ROBUSTNESS

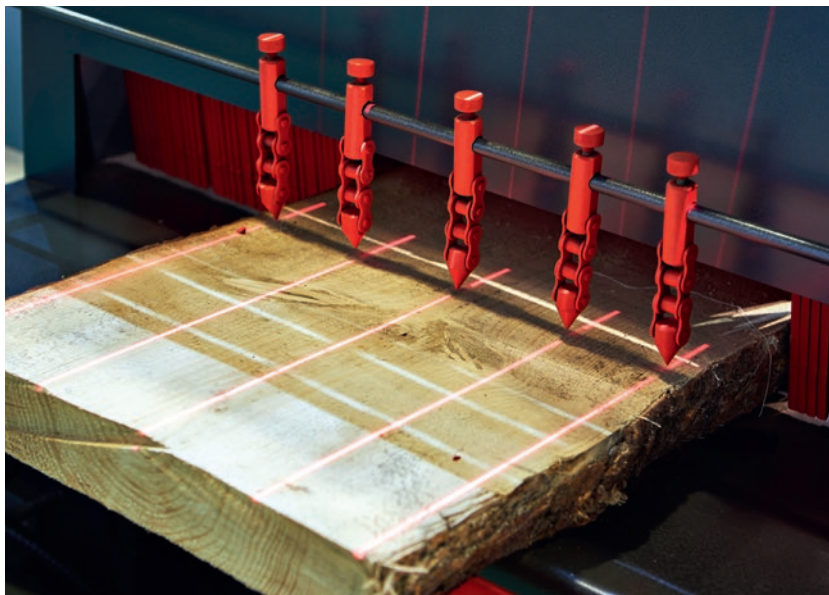
**Challenge:** Where there is sawing and planing, shavings will fall. It is crucial not to allow dust and vibrations to disrupt the positioning laser or to move it out of its specified position. Dust can not only impair the optical properties of the laser module, but it can also cause the laser to overheat and shorten the lifespan of the module. This is important especially if it is not installed in another housing but rather is mounted directly at the workstation.

**Solution:** Many laser modules for industry and trade already offer the dust and water resistance required for use in demanding work environments. Therefore, when purchasing positioning lasers, it is important to pay attention to the IP protection class: IP54 means protection against dust and spray water. Modules with IP67 are completely dustproof and can even be immersed in water for a short length of time. In many cases, IP54 models can be upgraded to IP67 with little effort.

If you want to make sure that your positioning laser is not affected by vibrations, you may choose a model with an integrated M12 thread. These modules can be quickly screwed to the appropriate mount and are then securely fixed.

»WE TALK TO THE CUSTOMER AT EYE LEVEL AND WORK OUT THE OPTIMAL SOLUTION TOGETHER.«

JOCHEN MAIER / *Head of Business Unit Opto Systems*



## / PATTERNS AND BEAM SHAPES

**Challenge:** Each operational step requires different markings. In sawing, a line defines the cutting edge; in drilling, it is a matter of marking an exact point. This is usually achieved with cross-shaped beams; however, in some cases, dot lasers are also used.

**Solution:** Think carefully about which beam shape you need for each operation step. In addition to lines, crosses, and dots, there are numerous other patterns, such as multiple lines, cross-hairs, and dot matrices for complex requirements.

## / LASER MODULES FOR THE WOOD INDUSTRY AND TRADE

LASER COMPONENTS' ILM12F and HD series laser modules are optimally tailored for use on industrial machines and in trade craft businesses and offer the following advantages:

- Robust design; depending on the model, with IP54 or IP67 protection class
- Choice of green (520 nm) or red (635 nm) light
- Robust laser modules with integrated M12 thread
- Numerous power supply options
- Choice of adjustable or fixed focus
- Eye safety; choice of laser class 1 or 2
- Numerous pattern options



### Expert Tipp

Working with the ILM12F Laser Module  
[icnews.net/ILM12\\_Operation](https://icnews.net/ILM12_Operation)

This link leads to a YouTube video. Google Ireland Limited's privacy policy applies.





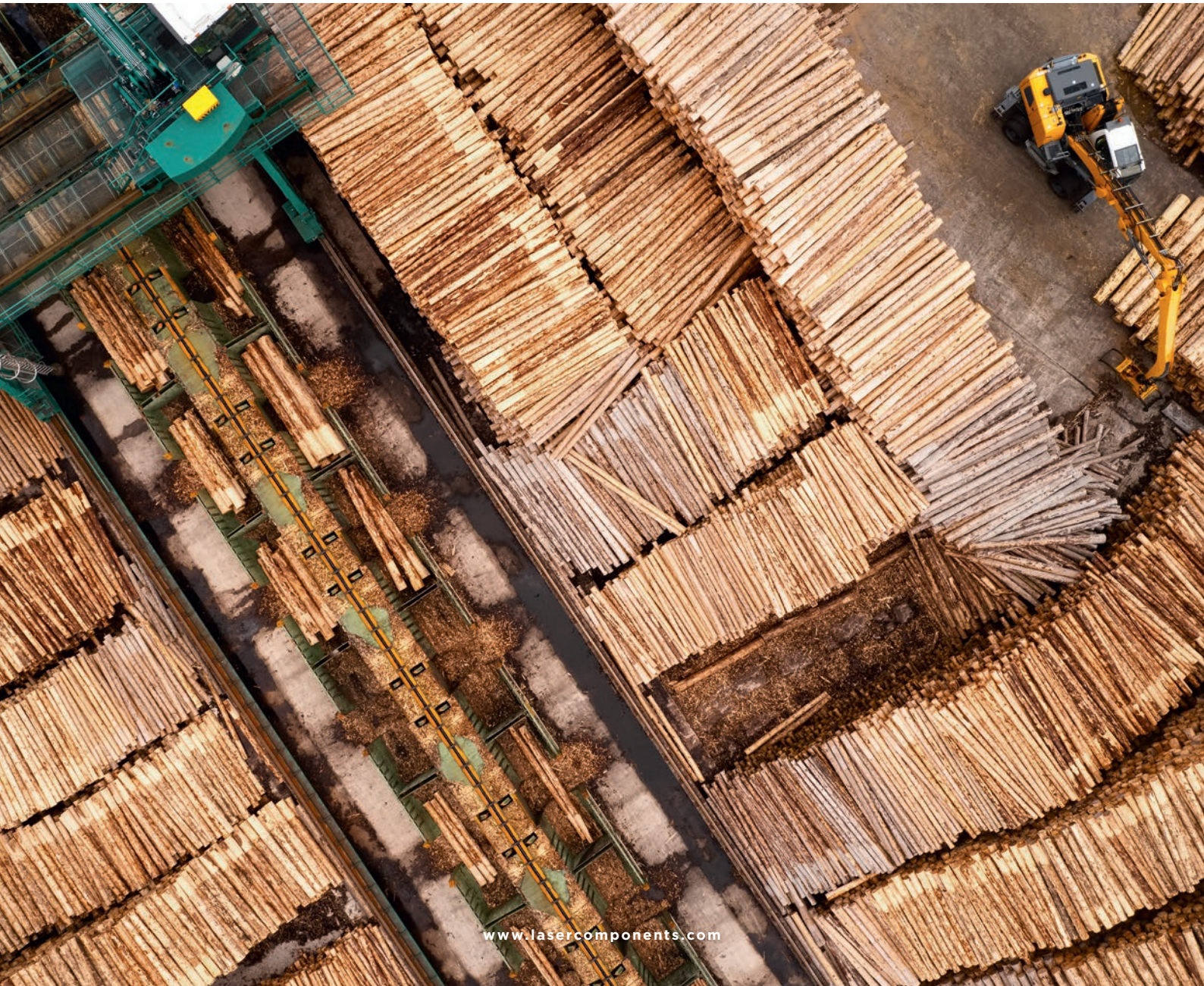


# MACHINE VISION

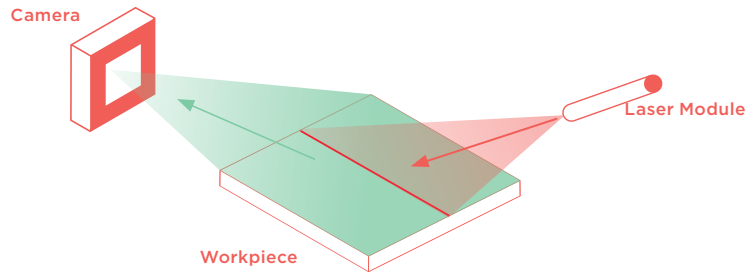
## COMPUTER MEETS NATURAL MATERIAL

Thanks to the use of machine vision, the timber industry today works much more efficiently than it did ten or twenty years ago. This is particularly evident in the optimization of sawmills and in quality control.

For example, it is possible to scan the logs completely before they are processed. This allows the volume of wood contained to be used optimally. Other machine vision systems scan the surfaces of boards and beams for hidden weak points.







For these tasks, machine vision faces industry-specific challenges that you should also consider when selecting laser modules.

- **Non-uniform surface texture:** Wood is a natural product. Unlike plastic or metal, it does not have a uniform surface finish. Uneven surfaces, knots, cracks, and discoloration can make image processing difficult and affect the accuracy of the results. To detect even small irregularities, high resolution is essential.
- **Variable size and shape:** No two logs are the same. To make the best use of the wood volume, the machine vision system must detect all bends and bulges. Here, too, high resolution is important. There should be as few gaps as possible when scanning the log.
- **Complex patterns:** The grain of the wood, with its complex patterns, is what makes wood so visually appealing. For automated systems, however, it is precisely this complexity that poses a major challenge because it makes recognition and classification difficult.
- **Environmental conditions:** The working environment in wood processing is dominated by dust, humidity, and vibrations, which are not ideal conditions for highly sensitive optical systems. To deliver reliable results, machine vision systems must be robust and stable.
- **High speeds:** In order to keep up with the high production speed in the wood industry, image processing must take place in real time.









## / WHAT DO MACHINE VISION LASERS HAVE TO BE ABLE TO DO?

What should you look for when choosing a laser to ensure that your machine vision system works efficiently and reliably?

- **Laser power:** High output power provides high-contrast images, which in turn allow detailed evaluation. At the same time, however, it is important to make sure that laser protection requirements are met.
- **Wavelength:** Structured light and triangulation systems for detecting three-dimensional structures usually work with single, clearly defined wavelengths. It is therefore important that the wavelengths of the laser and camera are optimally matched.
- **Homogeneity:** The laser beam must have a high degree of homogeneity. This means that the line has a consistent output power across the entire area covered by the camera. This ensures precision, consistency, and speed, which results in accurate and reliable data. This is where machine vision lasers differ from positioning lasers. In the latter, the power typically decreases toward the edges.
- **Line thickness:** A thin laser line means a higher resolution and thus the detection of more detail. At the same time, however, the depth of focus decreases with the decreasing line thickness. With the help of the different focus options of the laser, you can decide whether your system should be designed for a small line thickness or an extended depth of focus.
- **Easy to integrate into the system:** The cameras and lasers of machine vision systems are usually integrated into robust housings in the wood industry. The size of the laser module is an important factor here. The laser source and control electronics must take up as little space as possible.
- **Synchronization:** To achieve a higher resolution or to be able to use higher powers, the laser modules are increasingly synchronized with the camera. This allows the laser modules to only emit light at the very moment when the camera takes a picture. This only works if the laser module has a control input for synchronization. It is even better if you control and monitor synchronization with a microcontroller.

## / A SUITABLE MODULE FOR EVERY SYSTEM

FLEXPOINT® MV modules have a lot to offer:

- Compact machine vision modules in various space-saving configurations
- Wide range of patterns with lines, dotted lines, cross-hairs, etc.
- Output power of up to 200 mW
- Red (635 nm), green (520 nm), and blue (450 nm) wavelengths
- Homogeneous power distribution
- Adjustable or fixed focus





### 4 SECONDS

... for the system to scan  
1.2 million pixels.

### AWARD-WINNING

... With our innovative microprocessor design,  
the laser delivers up to 5 times higher output  
power and is still eye safe



**50  $\mu$ m**

... accuracy is not uncommon for 3D scanning with FLEXPOINT® MV modules.

**TIME SAVING**

... through 3D surface measurement.

**> 1.500 VARIANTS**

... now exist of our laser modules and new ones are added with every project



**LASER COMPONENTS -  
THE PERFECT SOLUTION  
FOR YOUR APPLICATION**



When selecting an appropriate laser module, many factors play a role and often influence each other. As always, it is a matter of weighing the individual aspects against each other to achieve the best results. Standardized off-the-shelf products often offer too few options.

To find the right solution, you need a trusted supplier that gives you the freedom to find an individual response to your technical needs.

All – i.e., 100 percent – of the laser modules from LASER COMPONENTS are manufactured in house at our German headquarters. Therefore, we can individually respond to your wishes and adjust the specifications of your laser module accordingly. You will receive competent support because our technical experts have many years of experience in technology and design and can also advise you on unusual projects – from the initial inquiry to the finished product.







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